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Patent Claims

1. (currently amended) An installation, in particular a vacuum process installation, for processing a substrate ~~(130; 230; 330; 430; 530)~~, in particular a semiconductor wafer, having at least one processing station ~~(582-588)~~, characterized in that to hold and/or transport the substrate ~~(130; 230; 330; 430; 530)~~, the installation comprises at least one frame ~~(110; 210; 310; 410; 510)~~ with a clamped-in carrier (120; 220; 320; 420; 520), it being possible for the substrate, ~~(130; 230; 330; 430; 530)~~ to be secured to the carrier, ~~(120; 220; 320; 420; 520)~~ over a large area.

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2. (currently amended) The installation as claimed in claim 1, characterized in that the at least one processing station ~~(582-588)~~ comprises a chuck electrode, ~~(140; 240; 340; 440)~~, having a planar outer surface, ~~(141; 244; 341; 441)~~, it being possible for the carrier ~~(120; 220; 320; 420; 520)~~ to be positioned parallel and adjacent to the outer surface ~~(141; 244; 341; 441)~~ of the chuck electrode, ~~(140; 240; 340; 440)~~.

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3. (currently amended) The installation as claimed in claim 2, characterized

a) in that the carrier ~~(120; 220; 320)~~ consists of a nonconductive dielectric material and is provided with a conductive layer ~~(122; 222; 322)~~ on one side;

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b) in that the frame ~~(110; 210; 310)~~ is conductive at least regionally; and

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c) in that the carrier ~~(120; 220; 320)~~ is clamped in the frame ~~(110; 210; 310)~~ in such a way that the

conductive layer ~~(122, 222, 322)~~ is contact-
connected to the conductive region of the frame.
~~(110, 210, 310)~~.

5 4. (currently amended) The installation as claimed in
claim 3, characterized in that the carrier ~~(120, 220,
320)~~ is formed by a vacuum-compatible, thermally stable
film, in particular of polyimide, and the conductive
layer ~~(122, 222, 322)~~ is formed by a vapor-deposited
10 metallization or a conductive polymer.

5. (currently amended) The installation as claimed in
claim 4, characterized in that the film ~~(120, 220, 320)~~
is from 50-200 μm , preferably approximately 100 μm ,
15 thick, and the metallization ~~(122, 222, 322)~~ is from
0.03-0.5 μm , preferably approximately 0.1 μm , thick.

6. (currently amended) The installation as claimed in
~~one of claims 2, to 5,~~ characterized in that the chuck
20 electrode ~~(347)~~ is constructed on a base body which
comprises a radiofrequency electrode, ~~(345)~~, the chuck
electrode ~~(347)~~ being electrically insulated from the
radiofrequency electrode, ~~(345)~~, with in particular an
insulated leadthrough ~~(348)~~ passing through the
25 radiofrequency electrode ~~(345)~~ being provided for
contact-connection of the chuck electrode. ~~(340)~~.

7. (currently amended) The installation as claimed in
~~one of claims 2, to 6,~~ characterized in that the chuck
30 electrode ~~(240)~~ comprises a dielectric, ~~(243)~~, in
particular a plate of aluminum oxide Al_2O_3 , which is
arranged in such a way that it lies between the chuck
electrode ~~(240)~~ and the carrier ~~(220)~~ when the carrier
~~(220)~~ has been positioned parallel and adjacent to the
35 outer surface (244) of the chuck electrode. ~~(240)~~.

8. (currently amended) The installation as claimed in
~~one of claims 2, to 7,~~ characterized in that the

processing station ~~(582-588)~~ comprises a voltage source ~~(150, 250, 350)~~ for applying a voltage between the frame ~~(110, 210, 310)~~ and the chuck electrode, ~~(140, 240, 340)~~, it being possible in particular to generate
5 a DC voltage of 200-1500 V, preferably 500-1000 V.

9. (currently amended) The installation as claimed in one of claims 2, ~~to 8~~, characterized in that the chuck electrode ~~(440)~~ comprises a plurality of regions of
10 different polarity.

10. (currently amended) The installation as claimed in ~~one of claims 2, to 9~~, characterized in that the processing station ~~(582-588)~~ comprises a gas feed ~~(142, 242, 342, 442)~~ for feeding a gas into a space between
15 the chuck electrode ~~(140, 240, 340, 440)~~ and the carrier, ~~(120, 220, 320, 420)~~, it preferably being possible to generate a gas pressure of more than 100 Pa.

20 11. (currently amended) A frame for the installation as claimed in ~~one of claims 1 to 10~~ for holding and/or transporting the substrate, ~~(130, 230, 330, 430)~~, characterized in that it is designed to clamp in a
25 carrier, ~~(120, 220, 320, 420)~~, in particular a film.

12. (currently amended) The frame as claimed in claim 11, characterized in that it is at least regionally conductive, in such a manner that a
30 conductive layer ~~(122, 222, 322)~~ of the clamped-in carrier ~~(120, 220, 320)~~ can be contact-connected through the conductive region.

13. (currently amended) A film which is to be clamped
35 into the frame as claimed in claim 11, ~~or 12~~, characterized in that on one side it has a conductive layer, ~~(122, 222, 322)~~, which is preferably formed by a vapor-deposited metallization or a conductive polymer,

and in that it is vacuum-compatible and thermally stable, the film substantially being produced from a non-conductive dielectric material, in particular from polyimide.

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14. (currently amended) A processing station for the installation as claimed in ~~one of claims 2, to 10,~~ characterized by a chuck electrode ~~(140, 240, 340, 440)~~ with a planar outer surface, ~~(141, 244, 341, 441)~~, the
10 extent of which corresponds to at least one main surface of the substrate, ~~(130, 230, 330, 430)~~, it being possible for the chuck electrode, ~~(140, 240, 340, 440)~~, together with a carrier ~~(120, 220, 320, 420)~~ positioned parallel and adjacent to the outer surface
15 ~~(141, 244, 341, 441)~~ of the chuck electrode, to form an electrostatic chuck device.

15. (currently amended) A method for processing a substrate, ~~(130, 230, 330, 430)~~, in particular a
20 semiconductor wafer, in a vacuum process installation, characterized in that the substrate ~~(130, 230, 330, 430)~~, in order to be held and/or transported, is secured over a large area to a carrier ~~(120, 220, 320, 420)~~ ~~clamped in a frame.~~ ~~(110, 210, 310, 410).~~

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16. (currently amended) The method as claimed in claim 15, characterized in that the substrate ~~(130, 230, 330, 430)~~ is adhesively bonded to a first planar main surface ~~(121, 221, 321, 421)~~ of the carrier ~~(120, 220, 320, 420)~~ by means of a vacuum-compatible and
30 releasable adhesive.

17. (currently amended) The method as claimed in claim 16, characterized in that a chuck electrode ~~(140, 240, 340, 440)~~ is arranged with a planar outer surface ~~(141, 244, 341, 441)~~ parallel and adjacent to a second planar main surface ~~(123, 223, 323, 423)~~ of the carrier, ~~(120, 220, 320, 420)~~, the second planar main

surface ~~(123, 223, 323, 423)~~ being on the opposite side from the first planar main surface. ~~(121, 221, 321, 421)~~.

- 5 18. (currently amended) The method as claimed in claim 17, characterized in that the first main surface ~~(121, 321, 421)~~ of the carrier ~~(120, 320, 420)~~ is provided with a conductive layer. ~~(122, 322, 422)~~.
- 10 19. (currently amended) The method as claimed in claim 18, characterized in that the chuck electrode ~~(347)~~ is built on a base body which is formed by a radiofrequency electrode (345), the chuck electrode ~~(347)~~ being electrically insulated from the
- 15 radiofrequency electrode, ~~(345)~~, and the voltage being applied between the chuck electrode ~~(347)~~ and the frame ~~(310)~~ in particular by means of an insulated leadthrough. ~~(348)~~.
- 20 20. (currently amended) The method as claimed in claim 17, characterized in that the second main surface ~~(223)~~ of the carrier ~~(220)~~ is provided with a conductive layer, ~~(222)~~, and in that a dielectric ~~(243)~~ is arranged between the chuck electrode ~~(240)~~ and the
- 25 second planar main surface ~~(223)~~ of the carrier. ~~(220)~~.
21. (currently amended) The method as claimed in ~~one of claims 17 to 20~~, characterized in that a voltage is applied between the frame ~~(110, 210, 310)~~ and the chuck
- 30 electrode. ~~(140, 240, 340)~~.
22. (currently amended) The method as claimed in ~~one of claims 17 to 21~~, characterized in that to control the temperature of the substrate ~~(130, 230, 330, 430)~~,
- 35 a gas at a superatmospheric pressure is introduced into a space between the second main surface ~~(123, 223, 323, 423)~~ of the carrier ~~(120, 220, 320, 420)~~ and the planar outer surface ~~(141, 244, 341, 441)~~ of the chuck

electrode_ ~~(140, 240, 340, 440)~~.

23. (currently amended) The method as claimed in ~~one~~
~~of claims 17, to 22,~~ characterized in that to release
5 the substrate ~~(130, 230, 330)~~ the conductive layer
~~(122, 222, 322)~~ of the carrier ~~(120, 220, 320)~~ is
short-circuited with the chuck electrode_ ~~(140, 240,~~
~~340)~~.